Low Level Counting Room SS-10

INSTRUCTION AND OPERATING MANUAL

THE MOSELEY

AUTOGRAF

trade mark

TYPE G-1

NULL DETECTOR

F. L. MOSELEY CO.

409 NO. FAIR OAKS AVENUE, PASADENA, CALIFORNIA

Low Level Counting Room SSB-10
COPY# DHM42

INSTRUCTION AND OPERATING MANUAL

for

TYPE G-1

NULL DETECTOR

F. L. Moseley Co., 409 N. Fair Oaks Avenue, Pasadena, California

TYPE G-1 NULL DETECTOR INSTRUCTIONS

DESCRIPTION

The Moseley Type G-1 Null Detector is designed to operate in conjunction with an Autograf Model 2A or 4 X-Y Recorder to permit the plotting of analog data in point form. The Null Detector maintains the recorder in a muted or immobilized form until receipt of a plot command (external contact closure). The recorder is then unmuted and proceeds to the point designated by the analog input to the recorder. Upon arriving at the desired point, the Null Detector commands the recorder to plot and provides a momentary contact closure for external equipment.

OPERATING INSTRUCTIONS

Plug the Null Detector into the recorder receptacle labeled "Point Plotter" (J-110). Power switch on recorder also operates null detector. Switch S-101 to "CALIBRATE" position to unmute the recorder for calibration purposes. When prepared for operation, switch to "OPERATE". Recorder is now muted and will advance to subsequent point only upon receipt of a plot command. The plot command is to be supplied by external circuitry and consists of a contact closure across J-102-1 and J-102-2.

The two screwdriver adjustments on the null detector are controls to set "time and "bias" for the detector tube. These are set to control the amount of time delay required after the plotter reaches null. They may be adjusted anywhere in the range where the plotter plots too soon, to where it never plots. With a correct setting the plotter will plot very shortly after reaching null. If the bias on the tube is around 15 volts, the controls are most easily adjusted. The "plotting complete" contact closure is supplied to external equipment from terminals J-102-3 and J-102-4.

CIRCUIT DESCRIPTION

Refer to drawing B-3692. Actuation of the plot command applies a plus pulse to the grid of V-101, causing the tube to conduct, which actuates K-1.

K-1-1 charges C-107.

K-1-2 opens to de-energize muting relay in the recorder. Mute relay in the recorder ungrounds error phase of the servo motors, allowing the servos to seek balance.

TYPE G-1 NULL DETECTOR INSTRUCTIONS

DESCRIPTION

The Moseley Type G-1 Null Detector is designed to operate in conjunction with an Autograf Model 2A or 4 X-Y Recorder to permit the plotting of analog data in point form. The Null Detector maintains the recorder in a muted or immobilized form until receipt of a plot command (external closure). The recorder is then unmuted and proceeds to the point designated by the analog input to the recorder. Upon arriving at the desired point, the Null Detector commands the recorder to plot and provides a momentary contact closure for external equipment.

OPERATING INSTRUCTIONS

Plug the Null Detector into the recorder receptacle labeled "Point Plotter" (J-110). Power switch on recorder also operates null detector. Switch S-101 to "CALIBRATE" position to unmute the recorder for calibration purposes. When prepared for operation, switch to "OPERATE". Recorder is now muted and will advance to subsequent point only upon receipt of a plot command. The plot command is to be supplied by external circuitry and consists of a contact closure across J-102-1 and J-102-2.

The two screwdriver adjustments on the null detector are controls to set "time and "bias" for the detector tube. These are set to control the amount of time delay required after the plotter reaches *null*. They may be adjusted anywhere in the range where the plotter plots too soon, to where it never plots. With a correct setting the plotter will plot very shortly after reaching null. If the bias on the tube is around 15 volts, the controls are most easily adjusted. The "plotting complete" contact closure is supplied to external equipment from terminals J-102-3 and J-102-4.

CIRCUIT DESCRIPTION

Refer to drawing S-1692. Actuation of the plot command applies a plus pulse to the grid of V-101, causing the tube to conduct, which actuates K-1.

K-1-1 charges C-107.

K-1-2 opens to de-energize muting relay in the recorder. Mute relay in the recorder ungrounds error phase of the servo motors, allowing the servos to seek balance.

TYPE G-1 NULL DETECTOR INSTRUCTIONS - Cont.

While the servos are seeking balance, a portion of the error signal will be rectified by CR-101 or CR-102 and applied across plot time control resistor R-106 opposing the negative bias applied to the grid across bias resistor R-108. When the servos reach balance, the error-induced opposing voltage across C-104 (adjusted for proper time delay) becomes no longer sufficient to cancel the negative grid bias. This causes V-101 to become non-conducting and K-1 is de-energized.

K-1-1 transfers charge of C-107, permitting it to discharge through K-2, K-2 being actuated momentarily.

K-1-2 closes to re-energize the recorder mute relay, again grounding out the error phase of the servos. K-2-1 energizes the pen momentarily to plot a dot.

K-2-2 provides a momentary contact closure for external equipment.

PARTS LIST
TYPE G-1 NULL DETECTOR

Circuit Symbol	Description	Mfr./Mfrs. Designation
C-101	Capacitor, tantalum 1.75 mfd/125 VDCW	Fansteel PP1.75B125C1
C-102, C-103	Capacitor, metalized paper .04 mfd/200 VDCW	Aerovox P83Z
C-104	Same as C-101	
C-105	Capacitor, electrolytic 25 mfd/50 VDCW	Sprague TVA-1306
C-106	Capacitor, electrolytic 30 mfd/150 VDCW	Sprague TVL-1408
C-107	Capacitor, electrolytic 1 mfd/150 VDCW	Sprague TE-1500
CR-101, CR-102	Diode, 80 VDC, 1.5 ma	International Rectifier 4U1
CR-103	Diode, 60 VDC, 11 ma	International Rectifier 3Y1
CR-104	Rectifier, germanium 300 V, 75 ma	General Electric 1N93
CR-105 through CR-107	Same as CR-101	
J-101	Plug, 12 pin (For Mod. 2D) Plug, 16 pin (For Mod. 2S)	Amphenol, #165-9 ♂ plug Cannon RSK-C16-22C1/2
J-102	Barrier strip, 4 terminal	Cinch Jones No. 4-141-Y
K-1, K-2	Relay, 15 K ohm coil, 4-C contacts	Allied Control T-154-CC-CC

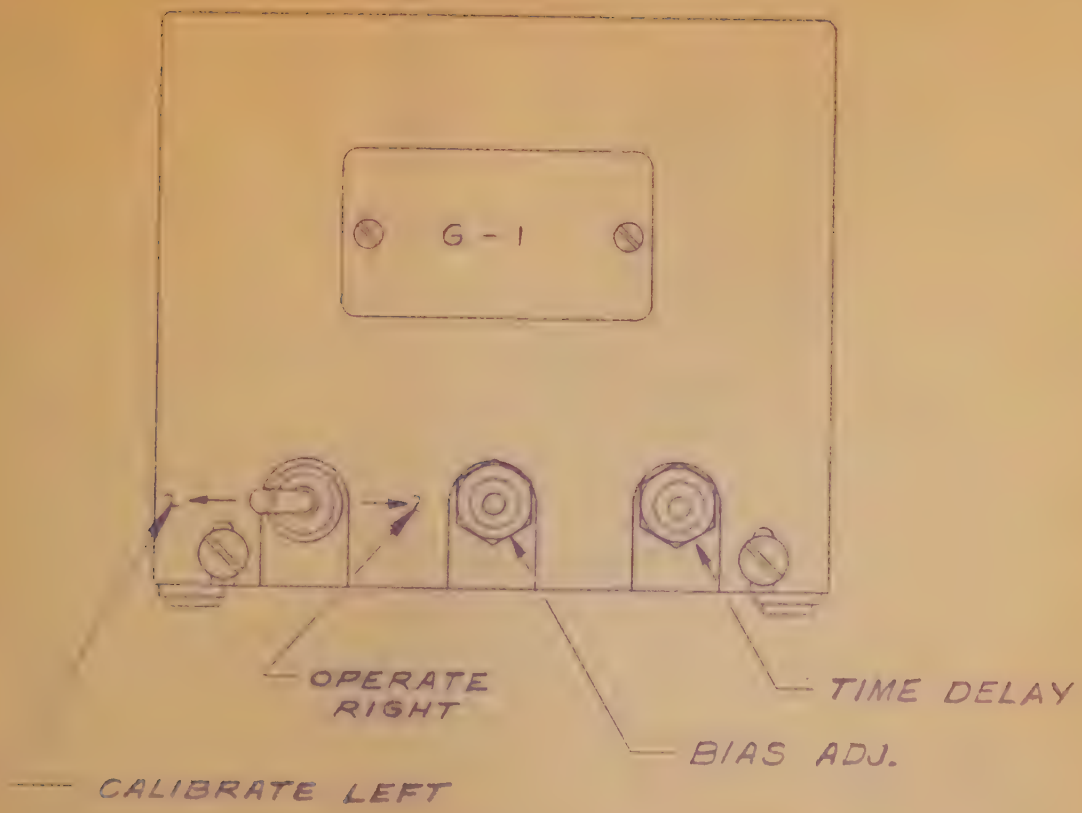
PARTS LIST

TYPE G-1 NULL DETECTOR

Circuit Symbol	Description	Mfr./Mfrs. Designation
C-101	Capacitor, tantalum 1.75 mfd/125 VDCW	Fansteel FPL.7581250-1
C-102, C-103	Capacitor, metallized paper .04 mfd/200 VDCW	Aerovox P832
C-104	Same as C-101	
C-105	Capacitor, electrolytic 25 mfd/50 VDCW	Sprague TVA-1306
C-106	Capacitor, electrolytic 30 mfd/150 VDCW	Sprague TVL-1608
C-107	Capacitor, electrolytic 1 mfd/150 VDCW	Sprague TE-1500
CR-101, CR-102	Diode, 80 VDC, 1.5 ma	International Rectifier 4U1
CR-103	Diode, 60 VDC, 11 ma	International Rectifier 3Y1
CR-104	Rectifier, germanium 300 V, 75 ma	General Electric 1N91
CR-105 through CR-107	Same as CR-101	
J-101	Plug, 12 pin (For mod. 2D) Plug, 16 pin (For Mod. 2S)	Amphenol, 41S3-9 Cannon BSK-C16-22C1/2
J-102	Barrier strip, 4 terminal	Cinch Jones No. 4-141-Y
K-1, K-2	Relay, 15 K ohm coil, 4-C contacts	Allied Control T-154-CC-CC

PARTS LIST
TYPE G-1 NULL DETECTOR

Circuit Symbol	Description	Mfr. / Mfrs. Designation
R-101, R-102	Resistor, carbon 100 K, 1/2 W	Allen-Bradley
R-103	Resistor, carbon 470 K, 1/2 W, ± 10%	Allen-Bradley
R-104, R-105	Resistor, carbon 47 K, 1/2 W, ± 10%	Allen-Bradley
R-106	Resistor, variable composition, 1 Meg., 1/2 W	IRC #RQ11-137A
R-107	Resistor, carbon 22 K, 1/2 W, ± 10%	Allen-Bradley
R-108	Resistor, variable 50 K, 1/2 W	IRC #RQ11-123A
R-109	Resistor, carbon 470 ohm, 1/2 W, ± 10%	Allen-Bradley
S-101	Switch, toggle, SPST	A H & H
T-101	Transformer, power	Moseley 202-0010
V-101	Tube, vacuum	RCA 6350


G - 1
OPERATE RIGHT
TIME DELAY
BIAS ADJ.
CALIBRATE LEFT

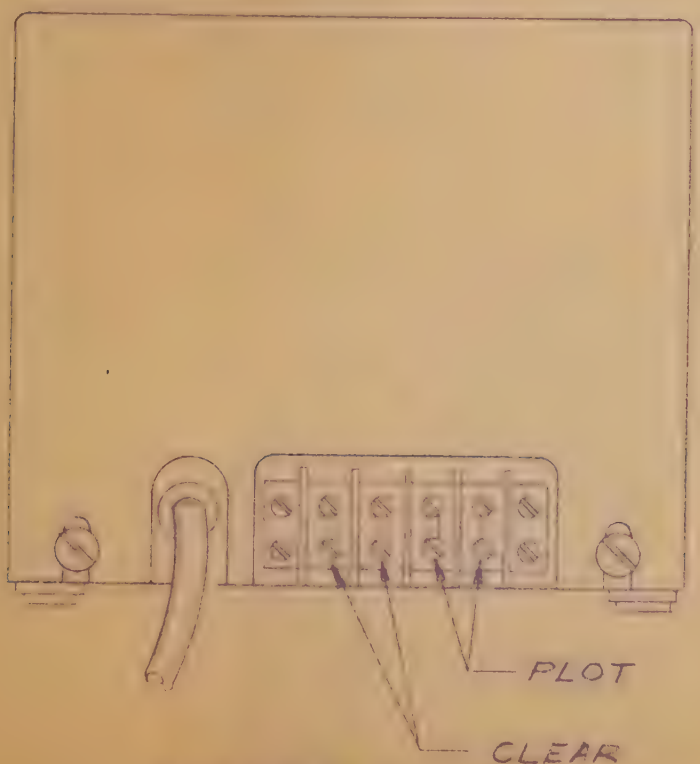
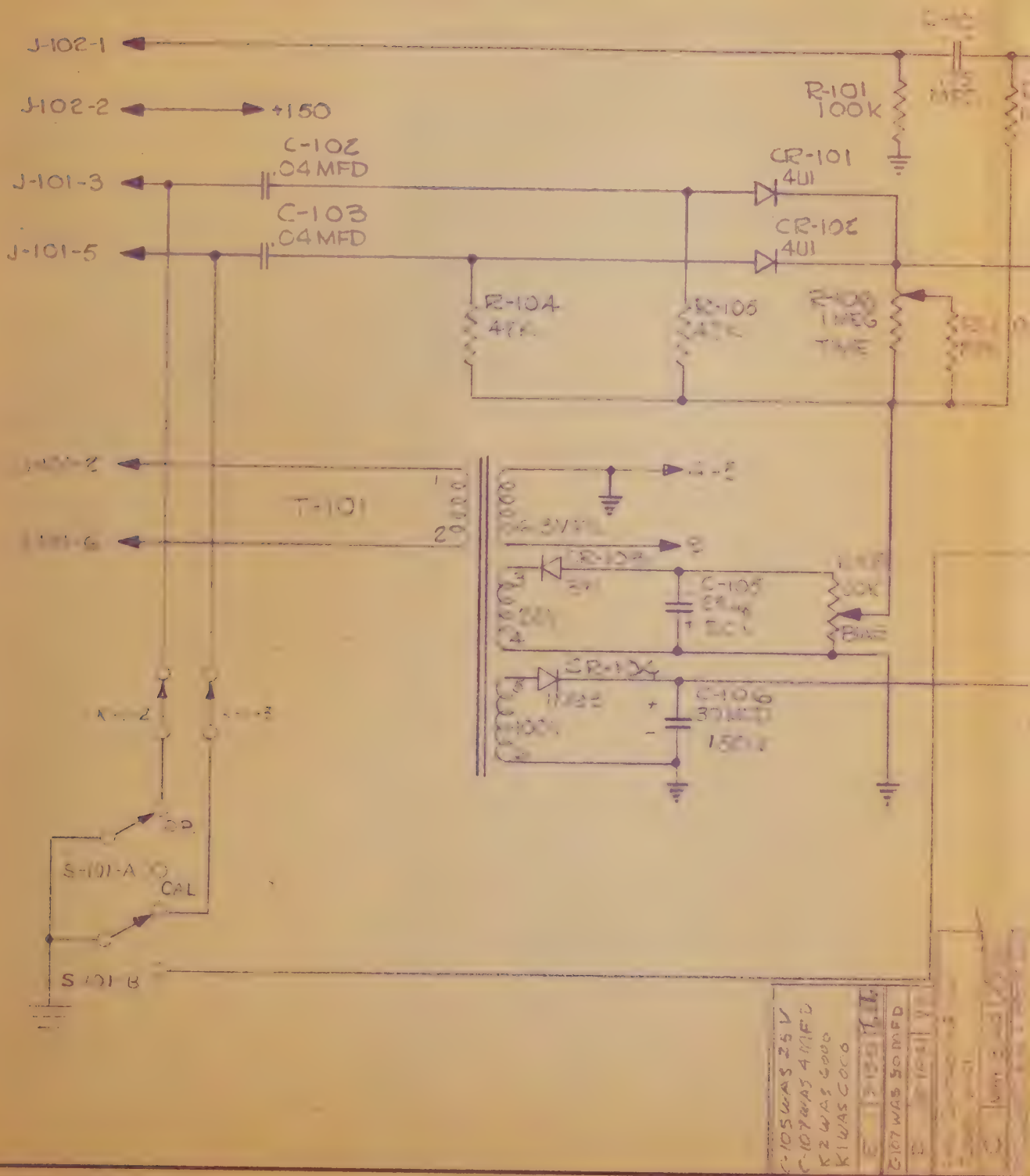
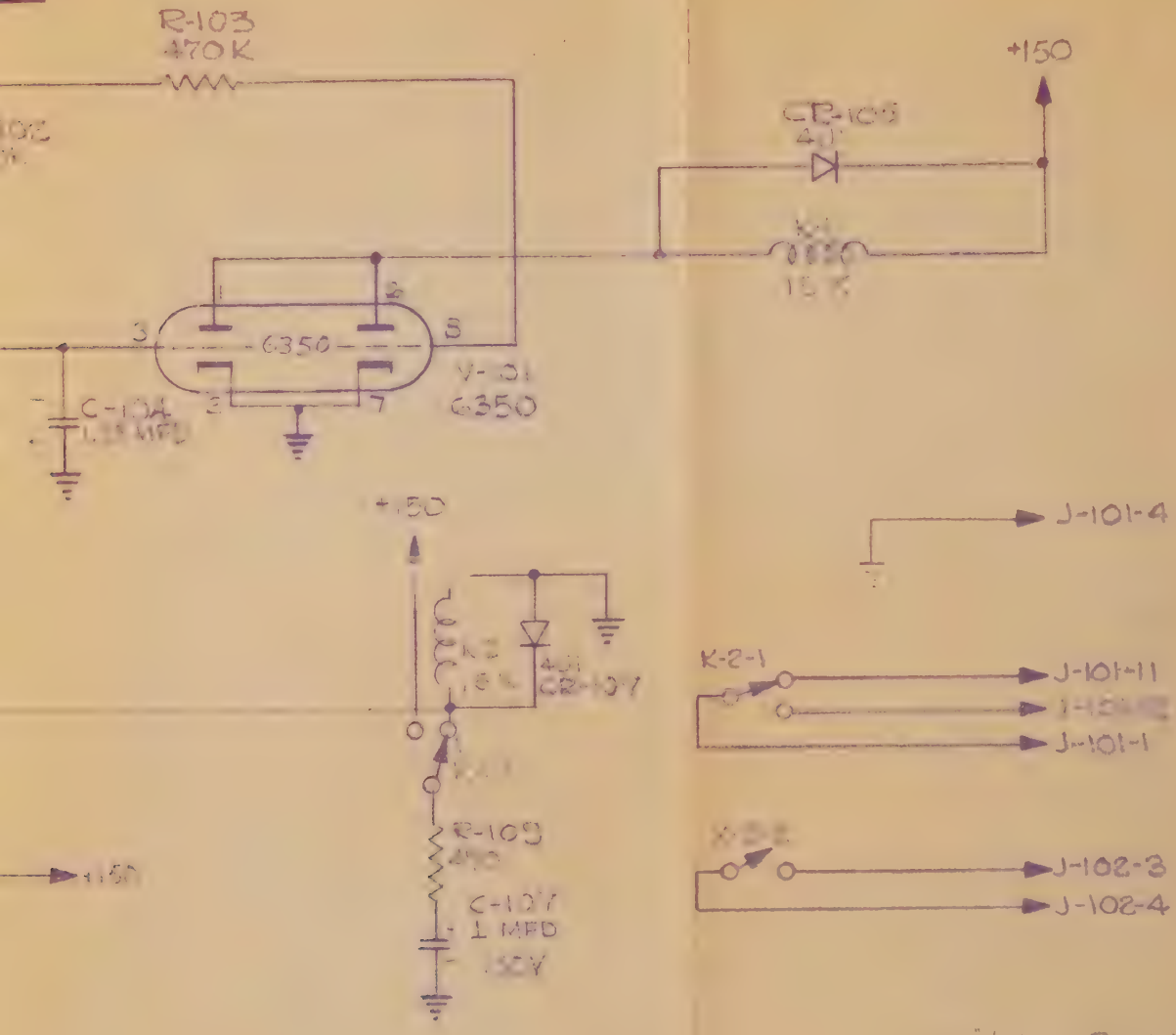

PLOT
CLEAR

FIGURE I


J-102-1
J-102-2
+150
J-101-3
J-101-5
C-102
.04 MFD
C-103
.04 MFD
R-101
100K
CR-101
4U1
CR-102
4U1
R-104
47K
R-105
47K
R-106
1 MEG
TIME
T-101
CR-104
C-105
CR-106
C-106
37 MFD
150V
K-2
K-3
S-101-A
OP
CAL
S-101-B
C-105 WAS 25V
C-107 WAS 4 MFD
K2 WAS CDC0
K1 WAS CDC0
C107 WAS 50 MFD

B3692



J-102 - Barrier Strip 4 terminal

F. L. MOSELEY CO. PASADENA CALIFORNIA		MAT'L:	
		FINISH:	
		DR: SAH	SCALE:
		CKD:	DATE:
		APPR:	NEXT ASS'Y:

TOLERANCE UNLESS OTHERWISE SPECIFIED:
FRACTIONAL: ± 1/64 DECIMAL: ± .005 ANGULAR: ± ½°
REMOVE BURRS AND BREAK SHARP EDGES
DO NOT SCALE DRAWING - WORK FROM DIMENSIONS ONLY

REVISIONS

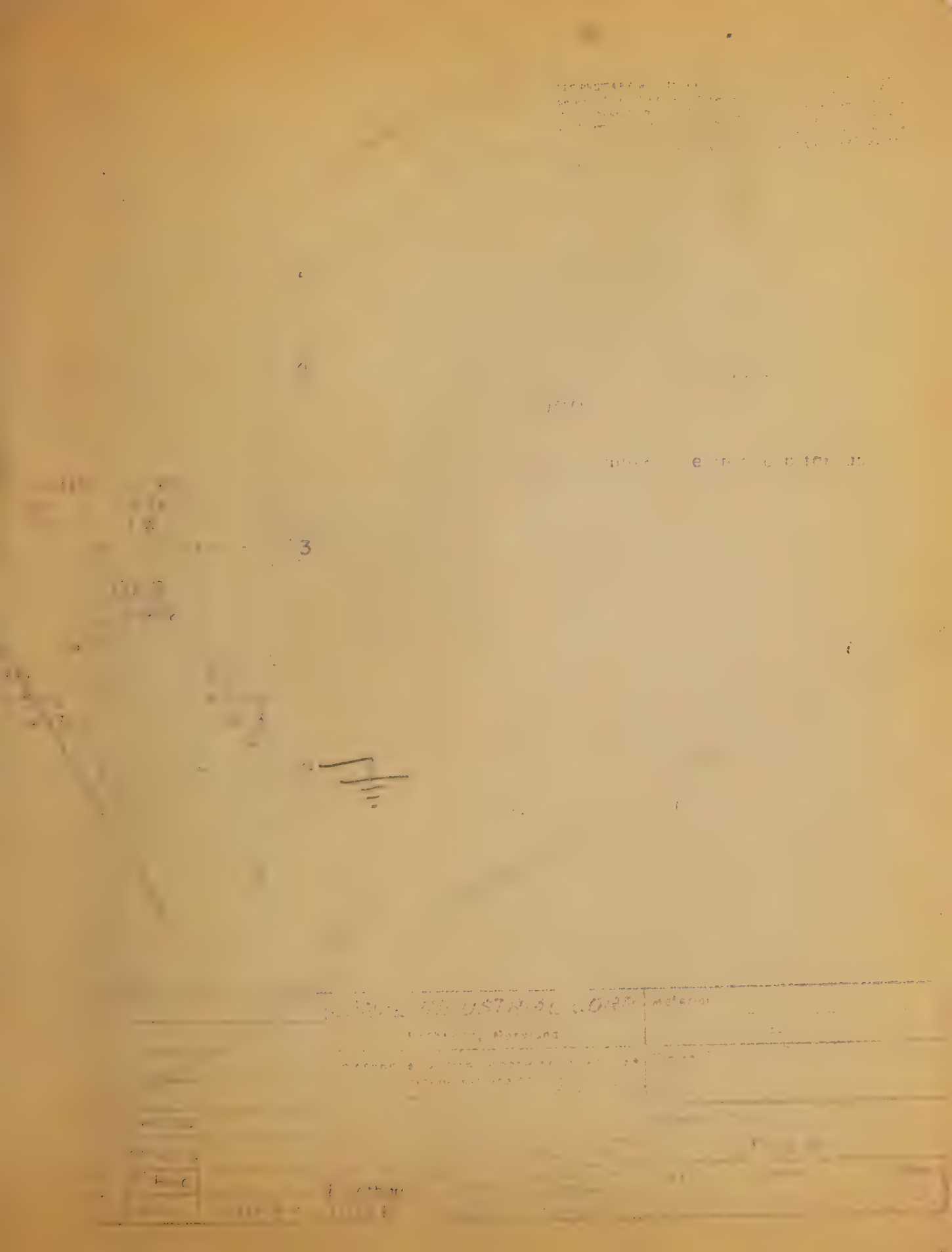
CORRECTED ENGINEERING ERRORS
REVISED CIRCUIT

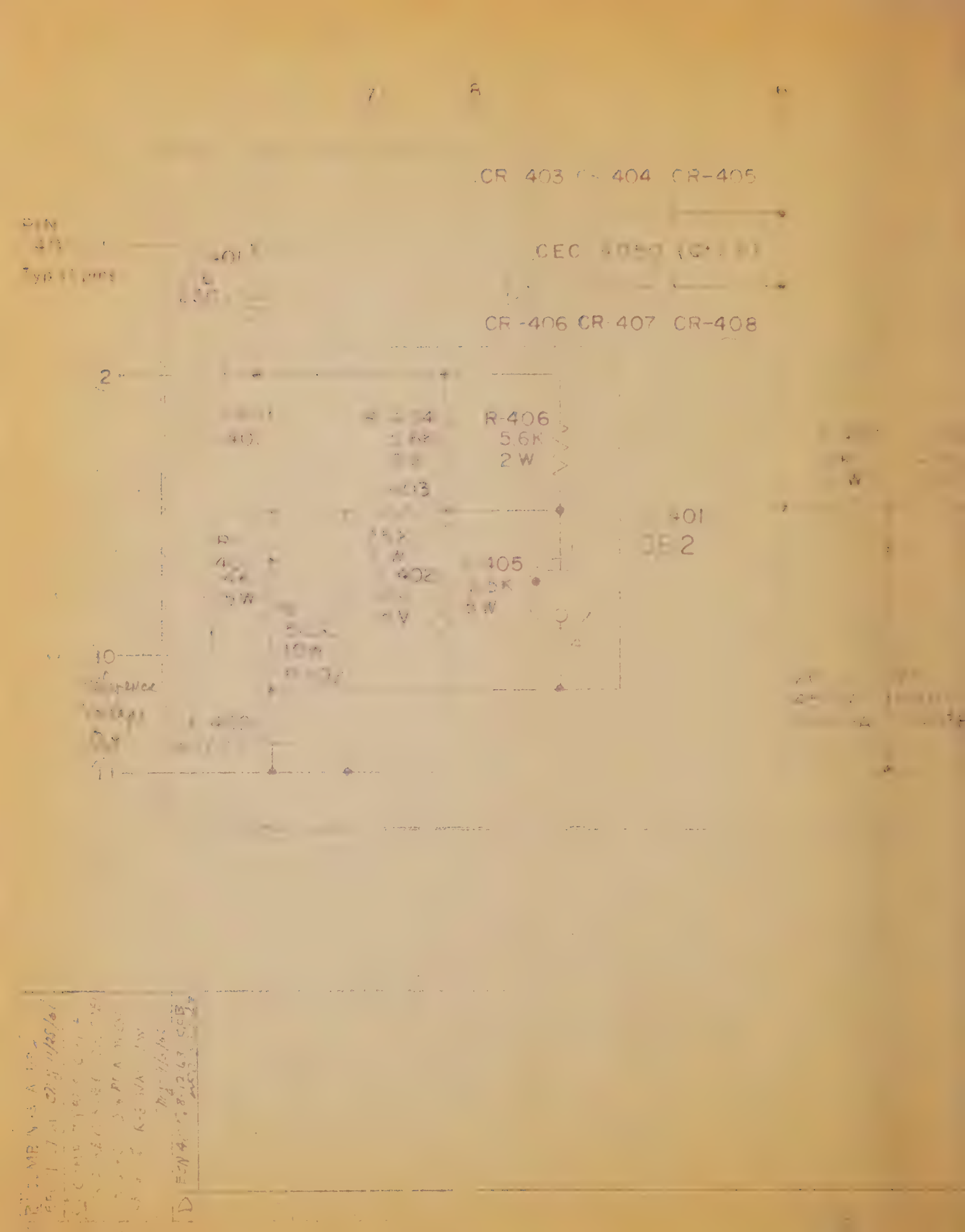
TITLE: SCHEM.-NULL DETECTOR IN 35-

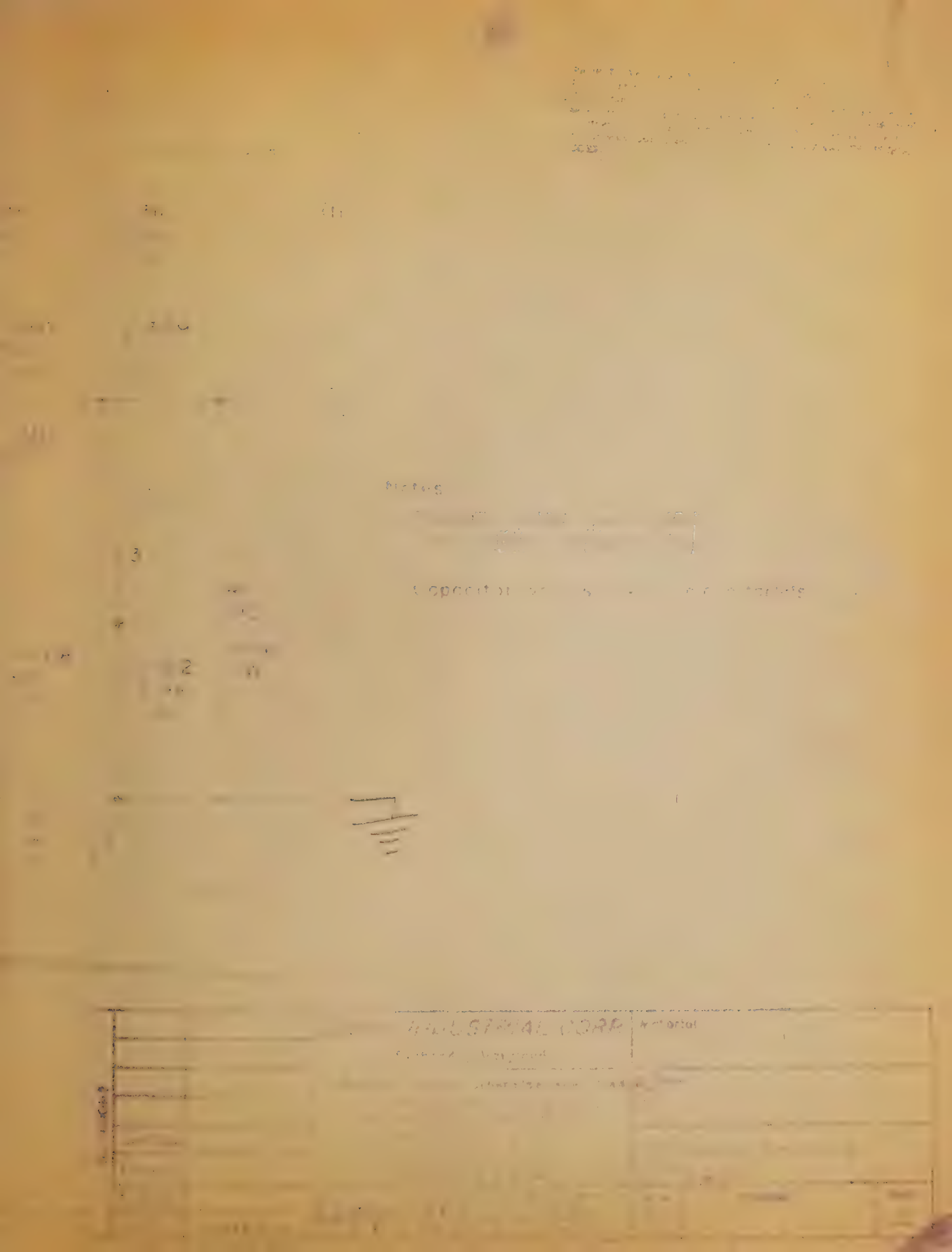
USED ON: TYPE G-1

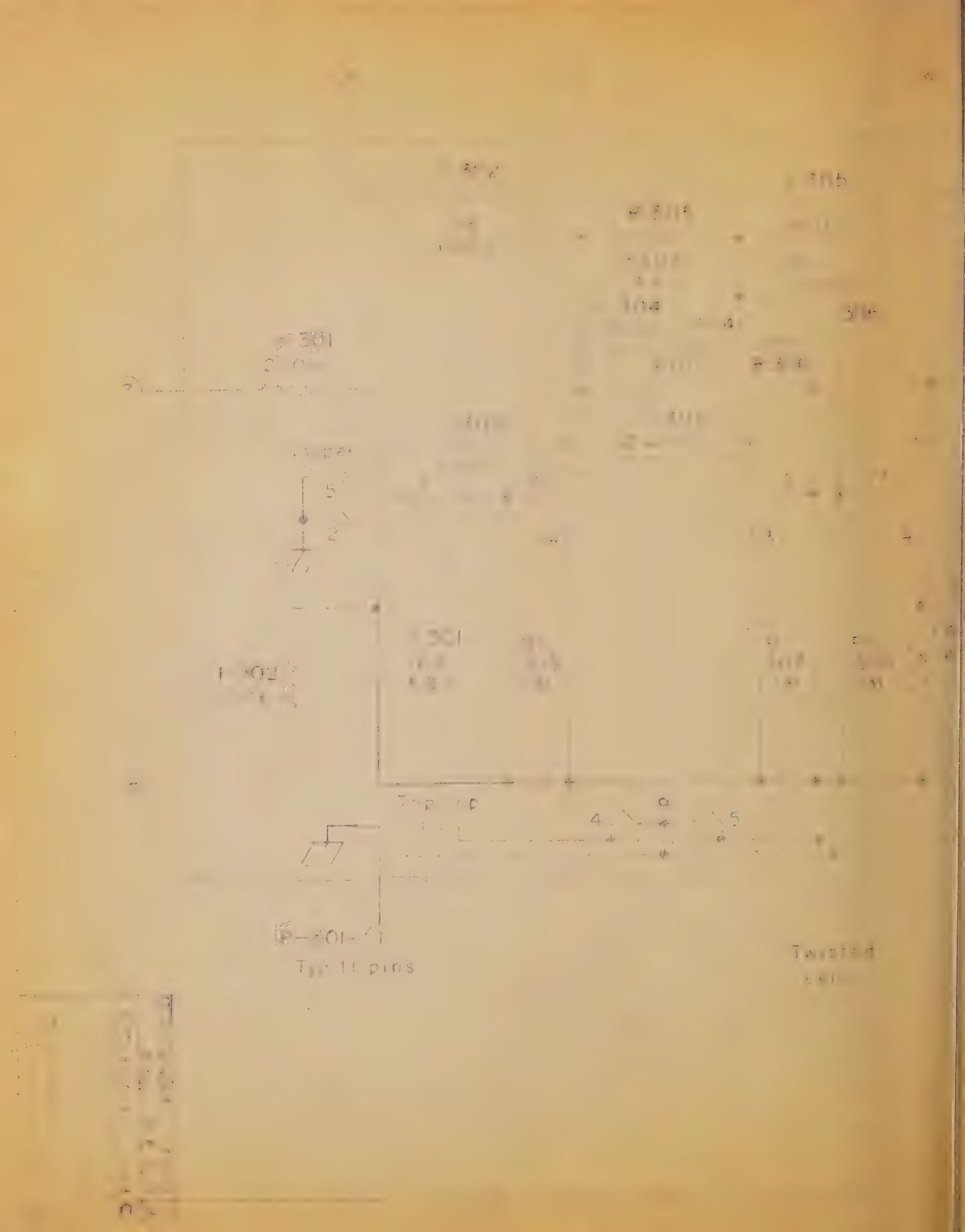
PART NO.: B-3692

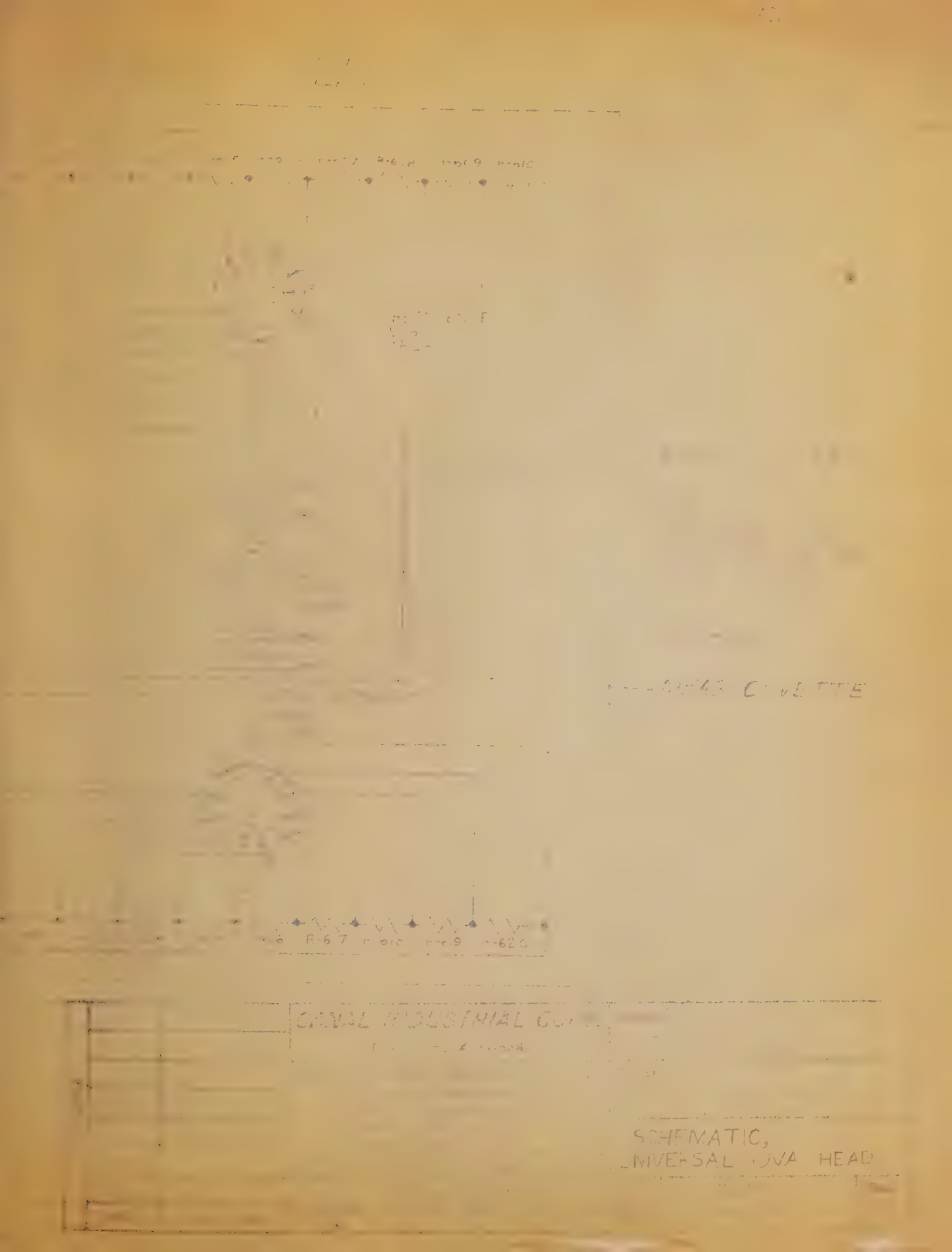
REV.: E




CR 403
404
CR-405
CR-406
CR 407
CR-408
R-406
5.6K
2 W
401
405
2
10

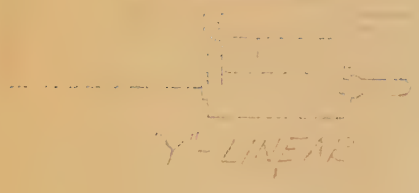






SCHEMATIC,
UNIVERSAL UVA HEAD

Red
WHT/BLK
UG709 A/U
WHITE
BLACK
Red
WHT/BLK



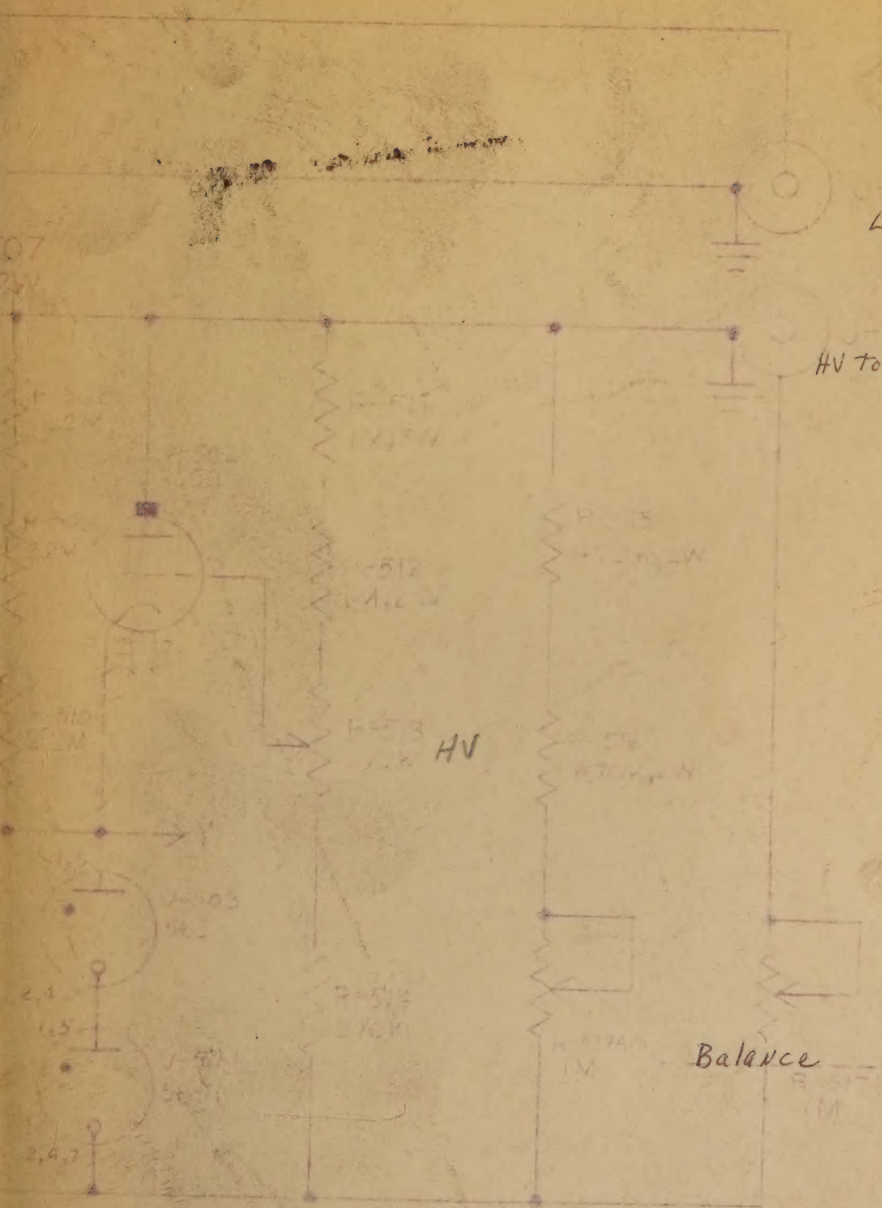
UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL DIMENSIONS ±.005 – DECIMAL DIMENSIONS ±.002

THE VICTOREEN INSTRUMENT CO.
INSTRUMENT DIV. CLEVELAND, OHIO

NAME

MATERIAL | FINISH

WHERE USED



NOTE
UNLESS OTHERWISE SPECIFIED:
1. RESISTORS ARE ½ WATT, VALUES ARE IN OHMS, K=1,000, M=1,000,000
2. CAPACITOR VALUES ARE IN MICROFARADS

CANAL INDUSTRIAL CORP.
Palisade, Maryland

Material

Tolerances unless otherwise specified
Fractional dimensions ± 1/64
Decimal dimensions ± .005
Angles +/- 1/2°
8 rms on edges .040

Finish

(Do not scale drawing) Scale

HEMATIC REAR MOUNT UNIVERSAL UVA

REVISIONS

Unit	Assy Dwg	Drawn C. Barton	Chkd	App for prod	Size	Number	Rev
1A1 REC							

THE MOSELEY